

APPENDIX B
TRANSFER OUT ANALYSIS

Transfer capability is the measure of the ability of the transmission system to reliably transfer electric power from one area (Source) to another area (Sink) by the way of all transmission lines between those areas under specific system conditions.

First Contingency Incremental Transfer Capability (FCITC) is the recommended NERC measure to evaluate the transfer capability. FCITC is defined as the amount of electric power, incremental above normal base power transfers that can be transferred over the interconnected transmission systems in a reliable manner.

In this study, the overall objectives of the transfer out analysis were:

to identify the levels of wind generation capacity within the Hanna region that can be delivered to the load centers outside the Hanna region via the area interconnection with the bulk system, and

to identify the maximum wind generation which could be delivered outside the Hanna region without creating any thermal overload conditions in the system.

The result of this approach provides an understanding of the transmission system ability in the Hanna region to deliver wind generation and how this transfer of power would affect the transmission system in the south area and the rest of Alberta bulk system. Siemens MUST Version 9 software was used to perform transfer out analysis.

The transfer out analysis was based on the following assumptions:

- The 2009, 2012, and 2017 Summer Light and Winter Peak conditions;
- The existing generation is dispatched as per generation scenario #5 prior to any additional transfer;
- The generation source is wind generation that is located in the Hanna region. In addition to the wind generation assumed in 2012 and 2017, one fictitious generator is modeled at Anderson bus to represent possible incremental wind addition in the Hanna region. The output of this fictitious generator is increased in steps from 0 to 1000 MW for calculating the first contingency incremental transfer out values;
- Wabamun area was assumed to be the sink;
- Category B contingencies for the entire AIES bulk were examined;. All the AIES facilities were monitored; and
- In 2017 the east HVDC line was dispatched at 1200 MW from south to north for both winter peak and summer light load conditions. The west HVDC line was dispatched at 400 MW from north to south in Winter peak condition and at 260 MW from north to south during summer light conditions (north to south)

During summer light conditions, the Hanna region generation, exceeds its load and the balance will have to be transferred out to the bulk system via three exiting 240 kV lines which are 912L from Red Deer 63S to Nevis 766S, 9L933/933L from Anderson 801S to West Brooks 28S and 931L from Ware Junction 132S to West Brooks 28S. for the existing system, the available transfer capability during summer light condition was found to be lower than the corresponding transfer capability during winter peak conditions.

For the existing system, the limiting thermal constraint is the line 931L from Ware Junction 132S to West Brooks 28S. This line becomes overloaded under the loss of 9L933/933L from Anderson 801 to West Brooks. The First Contingency Incremental Transfer Capability (FCITC) under such condition is only 45.7 MW. This indicates the need to reinforce the transmission path from Ware Junction to West Brooks.

The transfer analysis carried out for the planned system indicates that: under the proposed Generation Scenario B5, the three proposed alternatives are more than adequate to integrate about 500 MW by 2012 and 700 MW by 2017. No thermal overload observed at this level of wind integration.

Table B-1 presents a summary of transfer analysis results. Detailed transfer analysis reports for all cases are presented in Table B-2 to B-15.

The transfer analysis brief definition as defined by North American Electric Reliability Council (NERC)¹ is given below for reference.

¹ Transmission Transfer Capability, A Reference Document for Calculating and Reporting the Electric Power Transfer Capability of Interconnected Electric System, North American Electric Reliability Council, May 1995

Glossary of Terms

Distribution Factors

Line Outage Distribution Factor (LODF) – A measure of the redistribution of electric power on the remaining system facilities caused by an outage (or removal from service) of another system facility, expressed in percent (up to 100 %) of the pre-contingency electrical loading on the outaged facility.

Power Transfer Distribution Factor (PTDF) – A measure of the responsiveness or change in electrical loadings on system facilities due to a change in electric power transfer from one area to another, expressed in percent (up to 100%) of the change in power transfer. The PTDF applies only for the pre-contingency configuration of the system under study.

Outage Transfer Distribution Factor (OTDF) - The electric power transfer distribution factor (PTDF) with a specific system facility removed from service (outaged). The OTDF applied only for post-contingency configuration of the systems under study.

Transfer Capability

First Contingency Incremental Transfer Capability (FCITC) – The amount of electric power, incremental, above normal base power transfers, that can be transferred over the interconnected transmission systems in a reliable manner based on all of the following conditions:

1. For the existing or planned system configuration, and with normal (pre-contingency) operating procedures in effect, all facility loadings are within normal ratings and all voltages are within normal limits,
2. The electric systems are capable of absorbing the dynamic power swings, and remaining stable, following a disturbance that results in the loss of any single electric system element.
3. After the dynamic power swings subside following a disturbance as described in 2, and after operation of any automatic operating systems, but before any post contingency operator initiated system adjustments are implemented, all transmission facility loadings are within emergency ratings and all voltage within emergency limits.

Table B-1 FCITC Results Summary

| Case | Alternatives | Table No # | FCITC | Limiting Constraint | Limiting Contingency | Comments |
|-------------------|----------------|------------|-------|---|---|---|
| Existing 2009 SL | Not Applicable | Table B-2 | 46 | L: 225 WARE JCT 240 430 W BROOK4 240 31 | C: 430 W BROOK4 240 1484 ANDERSO4 240 33 | Not enough rooms on the interties for exporting wind power from Hanna region |
| Existing 2009 WP | Not Applicable | Table B-3 | 216 | L: 225 WARE JCT 240 430 W BROOK4 240 31 | C: 430 W BROOK4 240 1484 ANDERSO4 240 33 | |
| 2012 Summer Light | Alt1 | Table B-4 | 538 | 1422 NEVIS 4 240 10422 766S901T 240 : | C: 1422 NEVIS 4 240 1499 CORDEL 4 240 2(| All planning alternatives meet the 2012 target for integrating a minimum of 175 MW of wind generation |
| | Alt2 | Table B-5 | 477 | 1499 CORDEL 4 240 97501 HALKIRK_W1 240 5(| C: 97640 CLEMENT 4 240 97641 PEMUKAN 4 240 0(| |
| | Alt3 | Table B-6 | 538 | 1422 NEVIS 4 240 10422 766S901T 240 : | C: 1422 NEVIS 4 240 1499 CORDEL 4 240 2(| |
| 2012 Winter Peak | Alt1 | Table B-7 | 683 | 1422 NEVIS 4 240 10422 766S901T 240 : | C: 1422 NEVIS 4 240 1499 CORDEL 4 240 2(| |
| | Alt2 | Table B-8 | 462 | 1499 CORDEL 4 240 97501 HALKIRK_W1 240 5(| C: 97640 CLEMENT 4 240 97641 PEMUKAN 4 240 0(| |
| | Alt3 | Table B-9 | 683 | 1422 NEVIS 4 240 10422 766S901T 240 : | C: 1422 NEVIS 4 240 1499 CORDEL 4 240 2(| |
| 2017 Summer Light | Alt1 | Table B-10 | 341 | 225 WARE JCT 240 430 W BROOK4 240 31 | C: 225 WARE JCT 240 430 W BROOK4 240 1 | All planning alternatives meet the 2017 target for integrating a minimum of 700 MW of wind generation |
| | Alt2 | Table B-11 | 343 | 225 WARE JCT 240 430 W BROOK4 240 31 | C: 225 WARE JCT 240 430 W BROOK4 240 1 | |
| | Alt3 | Table B-12 | 319 | 225 WARE JCT 240 430 W BROOK4 240 31 | C: 225 WARE JCT 240 430 W BROOK4 240 1 | |
| 2017 Winter Peak | Alt1 | Table B-13 | 367 | 1422 NEVIS 4 240 10422 766S901T 240 : | C: 1422 NEVIS 4 240 1499 CORDEL 4 240 2(| |
| | Alt2 | Table B-14 | 626 | 225 WARE JCT 240 430 W BROOK4 240 31 | C: 225 WARE JCT 240 430 W BROOK4 240 1 | |
| | Alt3 | Table B-15 | 762 | 1422 NEVIS 4 240 10422 766S901T 240 : | C: 1422 NEVIS 4 240 1499 CORDEL 4 240 2(| |

Table B-2 FCITC 2009 Summer Light

| FCITC | Limiting Constraint | | | | | Contingency | | | | | Neon | PreShift | Rating | TDF | LODF | PTDF | Base Case Init | Base Case Final |
|-------|---------------------|--------------|-----|----------------|-----|-------------|-----------|--------------|-----|----------------|------|----------|--------|----------|----------|----------|----------------|-----------------|
| 45.7 | L: | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | | | | | | 474.4 | 499.0 | 0.53778 | | 0.34166 | 267.5 | 283.1 |
| | | | | | | | C: | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 102 | | | | | |
| | | | | | | | Open | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | 0.80320 | 0.24417 | 257.7 | 268.8 |
| 122.1 | L: | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | -440.7 | -499.0 | -0.47794 | | -0.24417 | -257.7 | -287.5 |
| | | | | | | | C: | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | 82 | | | | | |
| | | | | | | | Open | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | | | -0.68422 | 0.34166 | 267.5 | 309.2 |
| 175.5 | L: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | -442.2 | -499.0 | -0.32347 | | -0.19699 | -269.3 | -303.9 |
| | | | | | | | C: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 83 | | | | | |
| | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | -0.64225 | 0.19694 | 269.2 | 303.8 |
| 175.6 | L: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | -442.2 | -499.0 | -0.32344 | | -0.19694 | -269.2 | -303.8 |
| | | | | | | | C: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 84 | | | | | |
| | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | -0.64219 | 0.19699 | 269.3 | 303.9 |
| 413.4 | L: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | -375.8 | -499.0 | -0.29793 | | -0.19699 | -269.3 | -350.7 |
| | | | | | | | C: | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 102 | | | | | |
| | | | | | | | Open | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | -0.41343 | 0.24417 | 257.7 | 358.6 |
| 413.8 | L: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | -375.7 | -499.0 | -0.29785 | | -0.19694 | -269.2 | -350.7 |
| | | | | | | | C: | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 102 | | | | | |
| | | | | | | | Open | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | -0.41331 | 0.24417 | 257.7 | 358.7 |
| 428.8 | L: | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | | | | | | 307.7 | 499.0 | 0.44612 | | 0.34166 | 267.5 | 414.0 |
| | | | | | | | C: | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 46 | | | | | |
| | | | | | | | Open | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | 0.38276 | 0.27290 | 105.1 | 222.2 |
| 457 | L: | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | | | | | | 311.3 | 499.0 | 0.41070 | | 0.34166 | 267.5 | 423.6 |
| | | | | | | | C: | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 179 | | | | | |
| | | | | | | | Open | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | -0.30443 | -0.22679 | -144.1 | -247.8 |
| 578.3 | L: | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | -328.0 | -499.0 | -0.29564 | | -0.24417 | -257.7 | -398.9 |
| | | | | | | | C: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 84 | | | | | |
| | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | -0.26127 | 0.19699 | 269.3 | 383.2 |
| 578.4 | L: | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | -328.0 | -499.0 | -0.29562 | | -0.24417 | -257.7 | -398.9 |
| | | | | | | | C: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 83 | | | | | |
| | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | -0.26123 | 0.19694 | 269.2 | 383.2 |
| 583.5 | L: | 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 23 | | | | | | 310.5 | 581.0 | 0.46363 | | 0.24122 | 161.5 | 302.3 |
| | | | | | | | C: | 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 35 | 104 | | | | | |
| | | | | | | | Open | 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 35 | | | 0.92201 | 0.24122 | 161.5 | 302.3 |
| 583.5 | L: | 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 35 | | | | | | 310.5 | 581.0 | 0.46363 | | 0.24122 | 161.5 | 302.3 |
| | | | | | | | C: | 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 23 | 103 | | | | | |
| | | | | | | | Open | 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 23 | | | 0.92201 | 0.24122 | 161.5 | 302.3 |
| 677.7 | L: | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | | | | | | 267.5 | 499.0 | 0.34166 | | | | |
| | | | | | | | Base Case | | | | | | | | | | | |
| 848.6 | L: | 281 MILO 2 | 240 | 92066 LITTLEFO | 240 | 23 | | | | | | -254.9 | -581.0 | -0.38426 | | -0.24143 | -160.1 | -365.0 |
| | | | | | | | C: | 943 MILO 1 | 240 | 92066 LITTLEFO | 240 | 35 | 129 | | | | | |
| | | | | | | | Open | 943 MILO 1 | 240 | 92066 LITTLEFO | 240 | 35 | | | 0.59262 | -0.24102 | -160.0 | -364.5 |
| 849.4 | L: | 943 MILO 1 | 240 | 92066 LITTLEFO | 240 | 35 | | | | | | -254.8 | -581.0 | -0.38401 | | -0.24102 | -160.0 | -364.7 |
| | | | | | | | C: | 281 MILO 2 | 240 | 92066 LITTLEFO | 240 | 23 | 91 | | | | | |
| | | | | | | | Open | 281 MILO 2 | 240 | 92066 LITTLEFO | 240 | 23 | | | 0.59229 | -0.24143 | -160.1 | -365.2 |
| 865.6 | L: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | -287.5 | -499.0 | -0.24430 | | -0.19699 | -269.3 | -439.8 |
| | | | | | | | C: | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 46 | | | | | |
| | | | | | | | Open | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | -0.17337 | 0.27290 | 105.1 | 341.4 |
| 866.1 | L: | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | -287.5 | -499.0 | -0.24424 | | -0.19694 | -269.2 | -439.8 |
| | | | | | | | C: | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 46 | | | | | |
| | | | | | | | Open | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | -0.17332 | 0.27290 | 105.1 | 341.5 |
| 988.4 | L: | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | -257.7 | -499.0 | -0.24417 | | | | |
| | | | | | | | Base Case | | | | | | | | | | | |

Table B-3 FCITC 2009 Winter Peak

| FCITC | TDF | LODF | Limiting Constraint | | | | Contingency | | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | |
|-------|---------|----------|---------------------|-----|----------------|-----|-------------|--------------------|-----|----------------|------|----------|--------|--------|-------------|--------------|--------|--------|
| 215.7 | 0.5355 | 0.80223 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 102 | 383.5 | 499.0 | 0.34032 | 207.9 | 281.3 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 290.3 | -0.4757 | -0.68316 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | 82 | -360.9 | -499.0 | -0.24324 | -218.8 | -289.5 |
| | | | | | | | | Open 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | | | | | | |
| 330.7 | -0.3222 | -0.64198 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 83 | -392.4 | -499.0 | -0.19626 | -239.0 | -303.9 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 330.8 | -0.3222 | -0.64192 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 84 | -392.4 | -499.0 | -0.19621 | -239.0 | -303.9 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 397.0 | -0.0976 | 0.36776 | 160 JANET 4 | 240 | 165 PEIGAN 4 | 240 | 11 | C: 159 LANGDON4 | 240 | 90004 102ST2 | 240 | T2 | 60 | -210.3 | -249.0 | -0.06873 | -84.5 | -111.8 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 90004 102ST2 | 240 | T2 | | | | | | |
| 540.1 | 0.3921 | 0.83510 | 159 LANGDON4 | 240 | 160 JANET 4 | 240 | 37 | C: 159 LANGDON4 | 240 | 160 JANET 4 | 240 | 36 | 55 | 388.2 | 600.0 | 0.21369 | 211.5 | 327.0 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 160 JANET 4 | 240 | 36 | | | | | | |
| 540.1 | 0.3921 | 0.83510 | 159 LANGDON4 | 240 | 160 JANET 4 | 240 | 36 | C: 159 LANGDON4 | 240 | 160 JANET 4 | 240 | 37 | 56 | 388.2 | 600.0 | 0.21369 | 211.5 | 327.0 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 160 JANET 4 | 240 | 37 | | | | | | |
| 571.7 | -0.2967 | -0.41291 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 102 | -329.4 | -499.0 | -0.19626 | -239.0 | -351.2 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 572.1 | -0.2966 | -0.41280 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 102 | -329.3 | -499.0 | -0.19621 | -239.0 | -351.2 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 599.1 | 0.4460 | 0.38364 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 46 | 231.8 | 499.0 | 0.34032 | 207.9 | 411.8 |
| | | | | | | | | Open 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | | |
| 604.5 | 0.0981 | 0.42268 | 160 JANET 4 | 240 | 162 E CALGAR | 240 | 17 | C: 155 BENALTO4 | 240 | 161 SARCEE 4 | 240 | 28 | 49 | 439.7 | 499.0 | 0.14018 | 331.6 | 416.4 |
| | | | | | | | | Open 155 BENALTO4 | 240 | 161 SARCEE 4 | 240 | 28 | | | | | | |
| 607.1 | 0.0981 | 0.42270 | 160 JANET 4 | 240 | 162 E CALGAR | 240 | 17 | C: 155 BENALTO4 | 240 | 161 SARCEE 4 | 240 | 06 | 48 | 439.5 | 499.0 | 0.14018 | 331.6 | 416.7 |
| | | | | | | | | Open 155 BENALTO4 | 240 | 161 SARCEE 4 | 240 | 06 | | | | | | |
| 611.6 | 0.4649 | 0.40157 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 1484 ANDERSO4 | 240 | 1499 CORDEL 4 | 240 | 59 | 185 | 214.7 | 499.0 | 0.34032 | 207.9 | 416.1 |
| | | | | | | | | Open 1484 ANDERSO4 | 240 | 1499 CORDEL 4 | 240 | 59 | | | | | | |
| 734.1 | 0.0954 | 0.13304 | 1484 ANDERSO4 | 240 | 10484 801S901T | 240 | 1 | C: 1484 ANDERSO4 | 240 | 1499 CORDEL 4 | 240 | 59 | 185 | 55.0 | 125.0 | 0.05408 | 52.8 | 92.5 |
| | | | | | | | | Open 1484 ANDERSO4 | 240 | 1499 CORDEL 4 | 240 | 59 | | | | | | |
| 739.5 | -0.2945 | -0.26102 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 84 | -281.2 | -499.0 | -0.24324 | -218.8 | -398.7 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 739.7 | -0.2945 | -0.26097 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 83 | -281.2 | -499.0 | -0.24324 | -218.8 | -398.8 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 844.7 | 0.0727 | -0.08321 | 1484 ANDERSO4 | 240 | 10484 801S901T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 179 | 63.6 | 125.0 | 0.05408 | 52.8 | 98.5 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 855.3 | 0.3403 | - | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | Base Case | | | | | | 207.9 | 499.0 | | | |
| 905.2 | -0.2821 | -0.27662 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | C: 1484 ANDERSO4 | 240 | 1499 CORDEL 4 | 240 | 59 | 185 | -243.7 | -499.0 | -0.19626 | -239.0 | -416.7 |
| | | | | | | | | Open 1484 ANDERSO4 | 240 | 1499 CORDEL 4 | 240 | 59 | | | | | | |
| 905.7 | -0.2820 | -0.27655 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | C: 1484 ANDERSO4 | 240 | 1499 CORDEL 4 | 240 | 59 | 185 | -243.6 | -499.0 | -0.19621 | -239.0 | -416.7 |
| | | | | | | | | Open 1484 ANDERSO4 | 240 | 1499 CORDEL 4 | 240 | 59 | | | | | | |
| 930.3 | 0.1402 | - | 160 JANET 4 | 240 | 162 E CALGAR | 240 | 17 | C: 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | 181 | 368.6 | 499.0 | 0.14018 | 331.6 | 462.0 |
| | | | | | | | | Open 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | | | | | | |
| 975.0 | 0.4618 | 0.92183 | 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 23 | C: 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 35 | 104 | 130.8 | 581.0 | 0.24028 | 68.0 | 302.3 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 35 | | | | | | |
| 975.0 | 0.4618 | 0.92183 | 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 35 | C: 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 23 | 103 | 130.8 | 581.0 | 0.24028 | 68.0 | 302.3 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 92066 LITTLEFO | 240 | 23 | | | | | | |

Table B-4 FCITC 2012 Summer Light Alternative 1

| FCITC | TDF | LODF | Limiting Constraint | | | | Contingency | | | | Ncon | PreShift | Rating | PTDF | PreShtBase | PostShtBase | | |
|-------|---------|----------|---------------------|-----|------------------|-----|-------------|----------------------|-----|-----------------|------|----------|--------|--------|------------|-------------|--------|--------|
| 537.7 | -0.0978 | 0.19951 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 202 | -47.4 | -100.0 | -0.05199 | -19.0 | -47.0 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 672.4 | 0.2706 | 0.70352 | 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 27 | C: 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 24 | 145 | 422.1 | 604.0 | 0.16059 | 250.8 | 358.7 |
| | | | | | | | | Open 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 24 | | | | | | |
| 675.0 | 0.3966 | 0.71815 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | 110 | 331.3 | 599.0 | 0.23125 | 192.5 | 348.6 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | | | | | | |
| 675.7 | 0.3962 | 0.71729 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | 109 | 331.3 | 599.0 | 0.23027 | 193.2 | 348.8 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | | | | | | |
| 696.1 | -0.2593 | 0.63853 | 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 27 | C: 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 24 | 59 | -423.5 | -604.0 | -0.15739 | -257.4 | -367.0 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 24 | | | | | | |
| 696.2 | -0.2971 | -0.53593 | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 249 | -291.2 | -498.0 | -0.22626 | -205.9 | -363.4 |
| | | | | | | | | Open 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | | |
| 704.9 | -0.2606 | 0.64173 | 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 24 | C: 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 27 | 60 | -425.3 | -609.0 | -0.15959 | -260.1 | -372.6 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 27 | | | | | | |
| 709.6 | 0.2685 | 0.69797 | 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 24 | C: 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 27 | 146 | 418.5 | 609.0 | 0.15639 | 243.5 | 354.4 |
| | | | | | | | | Open 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 27 | | | | | | |
| 840.3 | -0.2263 | - | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | 204 | -307.9 | -498.0 | -0.22626 | -205.9 | -396.1 |
| | | | | | | | | Open 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | | | | | | |
| 957.5 | 0.2971 | 0.53593 | 1484 ANDERSO4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 249 | 213.5 | 498.0 | 0.22626 | 128.3 | 344.9 |
| | | | | | | | | Open 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | | |

Table B-5 FCITC Summer Light Alternative 2

| FCITC | TDF | LODF | Limiting Constraint | | | Contingency | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | | | |
|-------|---------|----------|---------------------|-----|------------------|-------------|----|----------------------|------|-----------------|--------|------|-------------|--------------|--------|----------|--------|--------|
| 477.1 | -0.3302 | 0.72478 | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97640 CLEMENT 4 | 240 | 97641 PEMUKAN 4 | 240 | 01 | 250 | -340.4 | -498.0 | -0.25014 | -191.1 | -310.5 |
| | | | | | | | | Open 97640 CLEMENT 4 | 240 | 97641 PEMUKAN 4 | 240 | 01 | | | | | | |
| 547.9 | -0.0971 | 0.20053 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 202 | -46.8 | -100.0 | -0.05061 | -19.9 | -47.6 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 658.2 | 0.2708 | 0.70404 | 943 MILO 1 | 240 | 92227 SUB_G_240 | 240 | 27 | C: 943 MILO 1 | 240 | 92227 SUB_G_240 | 240 | 24 | 145 | 425.7 | 604.0 | 0.16067 | 252.9 | 358.6 |
| | | | | | | | | Open 943 MILO 1 | 240 | 92227 SUB_G_240 | 240 | 24 | | | | | | |
| 660.2 | 0.3971 | 0.71912 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | 110 | 336.9 | 599.0 | 0.23138 | 195.6 | 348.4 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | | | | | | |
| 660.9 | 0.3966 | 0.71826 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | 109 | 336.9 | 599.0 | 0.23040 | 196.4 | 348.7 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | | | | | | |
| 682.3 | -0.2595 | 0.63913 | 159 LANGDON4 | 240 | 92227 SUB_G_240 | 240 | 27 | C: 159 LANGDON4 | 240 | 92227 SUB_G_240 | 240 | 24 | 59 | -426.9 | -604.0 | -0.15746 | -259.4 | -366.8 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 92227 SUB_G_240 | 240 | 24 | | | | | | |
| 691.1 | -0.2608 | 0.64234 | 159 LANGDON4 | 240 | 92227 SUB_G_240 | 240 | 24 | C: 159 LANGDON4 | 240 | 92227 SUB_G_240 | 240 | 27 | 60 | -428.8 | -609.0 | -0.15967 | -262.1 | -372.5 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 92227 SUB_G_240 | 240 | 27 | | | | | | |
| 695.4 | 0.2687 | 0.69849 | 943 MILO 1 | 240 | 92227 SUB_G_240 | 240 | 24 | C: 943 MILO 1 | 240 | 92227 SUB_G_240 | 240 | 27 | 146 | 422.1 | 609.0 | 0.15647 | 245.5 | 354.3 |
| | | | | | | | | Open 943 MILO 1 | 240 | 92227 SUB_G_240 | 240 | 27 | | | | | | |
| 712.2 | -0.3302 | 0.72478 | 97501 HALKIRK_W1 | 240 | 97640 CLEMENT 4 | 240 | 59 | C: 97640 CLEMENT 4 | 240 | 97641 PEMUKAN 4 | 240 | 01 | 250 | -262.8 | -498.0 | -0.25014 | -113.5 | -291.6 |
| | | | | | | | | Open 97640 CLEMENT 4 | 240 | 97641 PEMUKAN 4 | 240 | 01 | | | | | | |
| 737.6 | 0.1175 | -0.24520 | 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 202 | 213.3 | 300.0 | 0.06072 | 180.4 | 225.2 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 759.6 | -0.2501 | - | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | 204 | -308.0 | -498.0 | -0.25014 | -191.1 | -381.1 |
| | | | | | | | | Open 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | | | | | | |
| 955.3 | -0.2893 | 0.44499 | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | 127 | -221.6 | -498.0 | -0.25014 | -191.1 | -430.1 |
| | | | | | | | | Open 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | | | | | | |

Table B-6 FCITC Summer Light Alternative 3

| FCITC | TDF | LODF | Limiting Constraint | | | | Contingency | | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | |
|-------|---------|----------|---------------------|-----|------------------|-----|-------------|----------------------|-----|-----------------|------|----------|--------|--------|-------------|--------------|--------|--------|
| 537.7 | -0.0978 | 0.19951 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 202 | -47.4 | -100.0 | -0.05199 | -19.0 | -47.0 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 672.4 | 0.2706 | 0.70352 | 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 27 | C: 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 24 | 145 | 422.1 | 604.0 | 0.16059 | 250.8 | 358.7 |
| | | | | | | | | Open 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 24 | | | | | | |
| 675.0 | 0.3966 | 0.71815 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | 110 | 331.3 | 599.0 | 0.23125 | 192.5 | 348.6 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | | | | | | |
| 675.7 | 0.3962 | 0.71729 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | 109 | 331.3 | 599.0 | 0.23027 | 193.2 | 348.8 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | | | | | | |
| 696.1 | -0.2593 | 0.63853 | 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 27 | C: 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 24 | 59 | -423.5 | -604.0 | -0.15739 | -257.4 | -367.0 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 24 | | | | | | |
| 696.2 | -0.2971 | -0.53593 | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 249 | -291.2 | -498.0 | -0.22626 | -205.9 | -363.4 |
| | | | | | | | | Open 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | | |
| 704.9 | -0.2606 | 0.64173 | 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 24 | C: 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 27 | 60 | -425.3 | -609.0 | -0.15959 | -260.1 | -372.6 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 27 | | | | | | |
| 709.6 | 0.2685 | 0.69797 | 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 24 | C: 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 27 | 146 | 418.5 | 609.0 | 0.15639 | 243.5 | 354.4 |
| | | | | | | | | Open 943 MILO 1 | 240 | 92227 SUB G_240 | 240 | 27 | | | | | | |
| 840.3 | -0.2263 | - | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | 204 | -307.9 | -498.0 | -0.22626 | -205.9 | -396.1 |
| | | | | | | | | Open 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | | | | | | |
| 957.5 | 0.2971 | 0.53593 | 1484 ANDERSO4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 249 | 213.5 | 498.0 | 0.22626 | 128.3 | 344.9 |
| | | | | | | | | Open 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | | |

Table B-7 FCITC 2012 Winter Peak Alternative 1

| FCITC | TDF | LODF | Limiting Constraint | | | | Contingency | | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | |
|-------|---------|----------|---------------------|-----|------------------|-----|-------------|----------------------|-----|-----------------|------|----------|--------|--------|-------------|--------------|--------|--------|
| 683.3 | -0.0922 | 0.19951 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 203 | -37.0 | -100.0 | -0.04907 | -0.6 | -34.1 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 781.1 | -0.2820 | -0.53593 | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 250 | -277.7 | -498.0 | -0.21450 | -188.2 | -355.8 |
| | | | | | | | | Open 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | | |
| 965.4 | -0.2145 | - | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | 205 | -290.9 | -498.0 | -0.21450 | -188.2 | -395.3 |
| | | | | | | | | Open 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | | | | | | |

Table B-8 FCITC 2012 Winter Peak Alternative 2

| FCITC | TDF | LODF | Limiting Constraint | | | | Contingency | | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | |
|-------|---------|----------|---------------------|-----|------------------|-----|-------------|----------------------|-----|-----------------|------|----------|--------|--------|-------------|--------------|--------|--------|
| 464.2 | -0.3412 | 0.72820 | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97640 CLEMENT 4 | 240 | 97641 PEMUKAN 4 | 240 | 01 | 250 | -339.6 | -498.0 | -0.25822 | -169.9 | -289.8 |
| | | | | | | | | Open 97640 CLEMENT 4 | 240 | 97641 PEMUKAN 4 | 240 | 01 | | | | | | |
| 600.8 | -0.1023 | 0.20508 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 202 | -38.5 | -100.0 | -0.05313 | -1.8 | -33.7 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 691.8 | -0.3412 | 0.72820 | 97501 HALKIRK_W1 | 240 | 97640 CLEMENT 4 | 240 | 59 | C: 97640 CLEMENT 4 | 240 | 97641 PEMUKAN 4 | 240 | 01 | 250 | -262.0 | -498.0 | -0.25822 | -92.2 | -270.9 |
| | | | | | | | | Open 97640 CLEMENT 4 | 240 | 97641 PEMUKAN 4 | 240 | 01 | | | | | | |
| 758.1 | 0.4964 | 0.77134 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 110 | 215.7 | 592.0 | 0.32387 | 120.0 | 365.5 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 824.1 | -0.2582 | - | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | 204 | -285.2 | -498.0 | -0.25822 | -169.9 | -382.7 |
| | | | | | | | | Open 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | | | | | | |
| 895.8 | -0.4350 | -0.65250 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | 88 | -202.3 | -592.0 | -0.22367 | -124.0 | -324.4 |
| | | | | | | | | Open 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | | | | | | |
| 915.6 | 0.4389 | 0.39267 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 46 | 190.1 | 592.0 | 0.32387 | 120.0 | 416.6 |
| | | | | | | | | Open 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | | |
| 957.9 | 0.3866 | 0.72192 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | 109 | 228.7 | 599.0 | 0.22489 | 132.8 | 348.2 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | | | | | | |
| 959.3 | 0.3861 | 0.72107 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | 108 | 228.6 | 599.0 | 0.22394 | 132.9 | 347.7 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | | | | | | |
| 983.5 | -0.3538 | -0.18764 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | 88 | -201.0 | -549.0 | -0.29304 | -178.5 | -466.7 |
| | | | | | | | | Open 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | | | | | | |

Table B-9 FCITC 2012 Winter Peak Alternative 3

| FCITC | TDF | LODF | Limiting Constraint | | | | Contingency | | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | |
|--------|---------|----------|---------------------|-----|------------------|-----|-------------|----------------------|-----|-----------------|------|----------|--------|--------|-------------|--------------|--------|--------|
| 683.3 | -0.0922 | 0.19951 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 203 | -37.0 | -100.0 | -0.04907 | -0.6 | -34.1 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 781.1 | -0.2820 | -0.53593 | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 250 | -277.7 | -498.0 | -0.21450 | -188.2 | -355.8 |
| | | | | | | | | Open 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | | |
| 965.4 | -0.2145 | - | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | 205 | -290.9 | -498.0 | -0.21450 | -188.2 | -395.3 |
| | | | | | | | | Open 1469 BAT RV79 | 240 | 1499 CORDEL 4 | 240 | 79 | | | | | | |
| 1056.4 | 0.2820 | 0.53593 | 1484 ANDERSO4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 250 | 200.1 | 498.0 | 0.21450 | 110.6 | 337.2 |
| | | | | | | | | Open 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | | |
| 1077.8 | -0.2831 | 0.63853 | 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 27 | C: 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 24 | 59 | -298.8 | -604.0 | -0.17186 | -181.6 | -366.8 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 24 | | | | | | |
| 1078.0 | 0.3439 | 0.71815 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | 110 | 228.3 | 599.0 | 0.20052 | 132.8 | 349.0 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | | | | | | |
| 1079.6 | 0.3435 | 0.71729 | 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | 109 | 228.2 | 599.0 | 0.19966 | 132.9 | 348.4 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | | | | | | |
| 1085.4 | -0.2846 | 0.64173 | 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 24 | C: 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 27 | 60 | -300.1 | -609.0 | -0.17427 | -183.6 | -372.8 |
| | | | | | | | | Open 159 LANGDON4 | 240 | 92227 SUB G_240 | 240 | 27 | | | | | | |
| 1198.5 | 0.1103 | -0.25370 | 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 203 | 91.8 | 224.0 | 0.05551 | 45.5 | 112.0 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 1200.5 | -0.2652 | - | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | Base Case | | | | | | -180.6 | -499.0 | | | |
| 1211.6 | -0.2438 | 0.29000 | 1499 CORDEL 4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | 127 | -202.6 | -498.0 | -0.21450 | -188.2 | -448.1 |
| | | | | | | | | Open 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | | | | | | |
| 1234.6 | -0.2868 | -0.10767 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | 109 | -194.9 | -549.0 | -0.26519 | -180.6 | -508.0 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 23 | | | | | | |
| 1235.4 | -0.2866 | -0.10734 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | 110 | -194.9 | -549.0 | -0.26519 | -180.6 | -508.3 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 943 MILO 1 | 240 | 35 | | | | | | |

Table B-10 FCITC 2017 Summer Light Case Alternative 1

| FCITC | TDF | LODF | Limiting Constraint | | | | Contingency | | | | Ncon | PreShift | Rating | PTDF | PreShiftBase | PostShiftBase | | |
|-------|---------|----------|---------------------|-----|-----------------|-----|-------------|-----------------------|-----|-----------------|------|----------|--------|--------|--------------|---------------|--------|--------|
| 341.6 | 0.3111 | 0.70853 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | 88 | 485.7 | 592.0 | 0.17709 | 276.2 | 336.7 |
| | | | | | | | | Open 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | | | | | | |
| 536.9 | -0.3210 | -0.12516 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -325.7 | -498.0 | -0.29856 | -295.3 | -455.6 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 573.0 | -0.3158 | -0.09049 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -317.1 | -498.0 | -0.29856 | -295.3 | -466.4 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 573.1 | -0.3158 | -0.09048 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -317.0 | -498.0 | -0.29856 | -295.3 | -466.4 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 645.3 | -0.2986 | - | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | Base Case | | | | | | -295.3 | -488.0 | | | |
| 713.3 | -0.0628 | 0.05594 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 97501 HALKIRK_W1 | 240 | 97640 CLEMENT 4 | 240 | 59 | 269 | -55.2 | -100.0 | -0.04759 | -51.0 | -84.9 |
| | | | | | | | | Open 97501 HALKIRK_W1 | 240 | 97640 CLEMENT 4 | 240 | 59 | | | | | | |
| 732.7 | 0.1218 | -0.21526 | 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 205 | 134.7 | 224.0 | 0.06782 | 80.7 | 130.4 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 760.3 | -0.2478 | -0.23050 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 45 | -310.6 | -499.0 | -0.17901 | -242.5 | -378.6 |
| | | | | | | | | Open 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | | |
| 773.3 | -0.2802 | -0.61490 | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | C: 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | 206 | -282.3 | -499.0 | -0.25097 | -251.0 | -445.0 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | | | | | | |
| 806.3 | -0.2333 | -0.28492 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -310.9 | -499.0 | -0.17901 | -242.5 | -386.9 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 806.5 | -0.2332 | -0.28488 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -310.9 | -499.0 | -0.17901 | -242.5 | -386.9 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 819.7 | -0.3042 | -0.59804 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -383.7 | -633.0 | -0.19036 | -240.1 | -396.2 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 819.9 | -0.3041 | -0.59797 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -383.6 | -633.0 | -0.19031 | -240.0 | -396.1 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 823.6 | -0.2699 | -0.10599 | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -276.7 | -499.0 | -0.25097 | -251.0 | -457.7 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 835.3 | -0.3655 | 0.74948 | 97501 HALKIRK_W1 | 240 | 97640 CLEMENT 4 | 240 | 59 | C: 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | 130 | -192.7 | -498.0 | -0.27238 | -75.5 | -303.1 |
| | | | | | | | | Open 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | | | | | | |
| 846.3 | -0.2685 | 0.25805 | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | C: 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | 217 | -271.8 | -499.0 | -0.25097 | -251.0 | -463.4 |
| | | | | | | | | Open 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | | | | | | |
| 870.0 | -0.0510 | -0.01917 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -55.6 | -100.0 | -0.04759 | -51.0 | -92.4 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 882.9 | 0.1124 | 0.14924 | 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 45 | 124.8 | 224.0 | 0.06782 | 80.7 | 140.6 |
| | | | | | | | | Open 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | | |
| 883.5 | 0.2483 | 0.39761 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | 372.7 | 592.0 | 0.17709 | 276.2 | 432.7 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 948.5 | -0.2510 | - | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | Base Case | | | | | | -251.0 | -489.0 | | | |

Table B-11 FCITC 2017 Summer Light Case Alternative 2

| FCITC | TDF | LODF | Limiting Constraint | | | Contingency | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | | | |
|-------|---------|----------|---------------------|-----|-----------------|-------------|----|-----------------------|------|-----------------|--------|------|-------------|--------------|--------|----------|--------|--------|
| 343.3 | 0.3103 | 0.70840 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | 88 | 485.5 | 592.0 | 0.17666 | 276.9 | 337.5 |
| | | | | | | | | Open 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | | | | | | |
| 522.2 | -0.3224 | -0.12568 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -329.6 | -498.0 | -0.29996 | -299.1 | -455.8 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 558.3 | -0.3172 | -0.09087 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -320.9 | -498.0 | -0.29996 | -299.1 | -466.6 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 558.4 | -0.3172 | -0.09085 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -320.9 | -498.0 | -0.29996 | -299.1 | -466.6 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 629.6 | -0.3000 | - | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | Base Case | | | | | | -299.1 | -488.0 | | | |
| 728.3 | -0.0629 | 0.05467 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 97501 HALKIRK_W1 | 240 | 97640 CLEMENT 4 | 240 | 59 | 269 | -54.2 | -100.0 | -0.04730 | -50.6 | -85.0 |
| | | | | | | | | Open 97501 HALKIRK_W1 | 240 | 97640 CLEMENT 4 | 240 | 59 | | | | | | |
| 750.9 | 0.1226 | -0.21164 | 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 205 | 132.0 | 224.0 | 0.06912 | 77.9 | 129.8 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 753.8 | -0.2818 | -0.61684 | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | C: 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | 206 | -286.5 | -499.0 | -0.25266 | -255.3 | -445.8 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | | | | | | |
| 756.1 | -0.2478 | -0.23079 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 45 | -311.6 | -499.0 | -0.17858 | -242.6 | -377.6 |
| | | | | | | | | Open 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | | |
| 798.4 | -0.3741 | 0.78574 | 97501 HALKIRK_W1 | 240 | 97640 CLEMENT 4 | 240 | 59 | C: 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | 130 | -199.4 | -498.0 | -0.28524 | -66.3 | -294.0 |
| | | | | | | | | Open 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | | | | | | |
| 801.6 | -0.2717 | -0.10662 | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -281.2 | -499.0 | -0.25266 | -255.3 | -457.9 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 809.3 | -0.2327 | -0.28476 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -310.7 | -499.0 | -0.17858 | -242.6 | -387.1 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 809.5 | -0.2326 | -0.28472 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -310.7 | -499.0 | -0.17858 | -242.6 | -387.1 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 826.4 | -0.3034 | -0.59783 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -382.3 | -633.0 | -0.18990 | -239.3 | -396.2 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 826.6 | -0.3034 | -0.59776 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -382.2 | -633.0 | -0.18985 | -239.2 | -396.1 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 828.3 | -0.2702 | 0.25434 | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | C: 1489 BAT RV80 | 240 | 1499 CORDEL 4 | 240 | 80 | 216 | -275.2 | -499.0 | -0.25266 | -255.3 | -464.6 |
| | | | | | | | | Open 1489 BAT RV80 | 240 | 1499 CORDEL 4 | 240 | 80 | | | | | | |
| 883.3 | 0.2476 | 0.39737 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | 373.3 | 592.0 | 0.17666 | 276.9 | 432.9 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 883.7 | -0.0507 | -0.01906 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -55.2 | -100.0 | -0.04730 | -50.6 | -92.4 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 905.3 | 0.1130 | 0.14634 | 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 45 | 121.7 | 224.0 | 0.06912 | 77.9 | 140.5 |
| | | | | | | | | Open 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | | |
| 924.8 | -0.2527 | - | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | Base Case | | | | | | -255.3 | -489.0 | | | |

Table B-12 FCITC 2017 Summer Light Alternative 3

| FCITC | TDF | LODF | Limiting Constraint | | | Contingency | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | | | |
|-------|---------|----------|---------------------|-----|------------------|-------------|----|--------------------|-----------------|------------------|------------------|------|-------------|--------------|--------|----------|--------|--------|
| 319.1 | 0.3188 | 0.70980 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | 88 | 490.3 | 592.0 | 0.18131 | 278.6 | 336.5 |
| | | | | | | | | Open | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | | | | | |
| 573.9 | -0.3102 | -0.12143 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -320.0 | -498.0 | -0.28799 | -290.2 | -455.5 |
| | | | | | | | | Open | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | |
| 611.2 | -0.3051 | -0.08776 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -311.5 | -498.0 | -0.28799 | -290.2 | -466.3 |
| | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | |
| 611.3 | -0.3051 | -0.08775 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -311.5 | -498.0 | -0.28799 | -290.2 | -466.3 |
| | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | |
| 614.6 | -0.0661 | -0.06761 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 1484 ANDERSO4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | 212 | -59.4 | -100.0 | -0.04978 | -52.8 | -83.4 |
| | | | | | | | | Open | 1484 ANDERSO4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | | | | | |
| 642.8 | -0.0563 | -0.04675 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 271 | -63.8 | -100.0 | -0.04978 | -52.8 | -84.8 |
| | | | | | | | | Open | 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | |
| 686.7 | -0.2880 | - | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | Base Case | | | | | | -290.2 | -488.0 | | | |
| 697.8 | 0.1187 | -0.22920 | 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 205 | 141.2 | 224.0 | 0.06411 | 85.3 | 130.0 |
| | | | | | | | | Open | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | |
| 756.3 | -0.2488 | -0.22743 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 45 | -310.9 | -499.0 | -0.18328 | -244.8 | -383.5 |
| | | | | | | | | Open | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | |
| 772.3 | -0.2391 | -0.28641 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -314.3 | -499.0 | -0.18328 | -244.8 | -386.4 |
| | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | |
| 772.5 | -0.2391 | -0.28636 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -314.3 | -499.0 | -0.18328 | -244.8 | -386.4 |
| | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | |
| 785.1 | -0.3118 | -0.59998 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -388.2 | -633.0 | -0.19490 | -242.6 | -395.7 |
| | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | |
| 785.3 | -0.3118 | -0.59991 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -388.2 | -633.0 | -0.19485 | -242.6 | -395.6 |
| | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | |
| 802.3 | 0.3242 | 0.59603 | 1484 ANDERSO4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 271 | 237.9 | 498.0 | 0.24100 | 97.5 | 290.9 |
| | | | | | | | | Open | 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | |
| 832.8 | -0.2682 | -0.60306 | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | C: 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | 206 | -275.6 | -499.0 | -0.23820 | -243.8 | -442.2 |
| | | | | | | | | Open | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | | | | | |
| 839.5 | 0.1101 | 0.15957 | 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 45 | 131.6 | 224.0 | 0.06411 | 85.3 | 139.1 |
| | | | | | | | | Open | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | |
| 846.5 | 0.2546 | 0.39980 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | 376.5 | 592.0 | 0.18131 | 278.6 | 432.1 |
| | | | | | | | | Open | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | |
| 897.1 | -0.2568 | -0.10141 | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -268.6 | -499.0 | -0.23820 | -243.8 | -457.5 |
| | | | | | | | | Open | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | |
| 909.0 | -0.2555 | 0.26949 | 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | C: 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | 217 | -266.8 | -499.0 | -0.23820 | -243.8 | -460.3 |
| | | | | | | | | Open | 1489 BAT RV80 | 240 | 11499 757S912T | 240 | 1 | | | | | |
| 948.3 | -0.0498 | - | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | Base Case | | | | | | -52.8 | -100.0 | | | |

Table B-13 FCITC 2017 Winter Peak Case Alternative 1

| FCITC | TDF | LODF | Limiting Constraint | | | | Contingency | | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | |
|-------|---------|----------|---------------------|-----|-----------------|-----|-------------|-------------------|-----|-----------------|------|----------|--------|--------|-------------|--------------|--------|--------|
| 367.5 | -0.0972 | 0.19763 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 206 | -64.3 | -100.0 | -0.04762 | -24.8 | -42.3 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 609.9 | 0.3114 | 0.70852 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | 88 | 402.1 | 592.0 | 0.17726 | 229.1 | 337.2 |
| | | | | | | | | Open 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | | | | | | |
| 840.7 | -0.3651 | 0.74955 | 97501 HALKIRK_W1 | 240 | 97640 CLEMENT 4 | 240 | 59 | C: 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | 130 | -191.1 | -498.0 | -0.27218 | -61.1 | -290.0 |
| | | | | | | | | Open 649 HANSMAN7 | 240 | 97641 PEMUKAN 4 | 240 | 01 | | | | | | |
| 910.5 | -0.3045 | -0.59802 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -355.8 | -633.0 | -0.19055 | -222.7 | -396.2 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 910.8 | -0.3044 | -0.59796 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -355.7 | -633.0 | -0.19050 | -222.6 | -396.1 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 930.9 | -0.2985 | - | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | Base Case | | | | | | -221.1 | -499.0 | | | |
| 937.8 | -0.3210 | -0.12511 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -248.0 | -549.0 | -0.29854 | -221.1 | -501.1 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |
| 939.6 | -0.2479 | -0.23029 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 45 | -266.0 | -499.0 | -0.17918 | -215.1 | -383.5 |
| | | | | | | | | Open 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | | |
| 944.2 | -0.2335 | -0.28491 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -278.6 | -499.0 | -0.17918 | -215.1 | -384.3 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 944.4 | -0.2335 | -0.28487 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -278.5 | -499.0 | -0.17918 | -215.1 | -384.3 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 974.6 | -0.3158 | -0.09045 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -241.2 | -549.0 | -0.29854 | -221.1 | -512.1 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 974.7 | -0.3158 | -0.09044 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -241.2 | -549.0 | -0.29854 | -221.1 | -512.1 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |

Table B-14 FCITC 2017 Winter Peak Case Alternative 2

| FCITC | TDF | LODF | Limiting Constraint | | | Contingency | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | | | | | | |
|-------|---------|----------|---------------------|-----|---------------|-------------|-----|-----------------|-----------------|---------------|---------------|---------------|----------------|--------------|--------|----------|----------|----------|----------|--------|--------|
| 624.6 | 0.3106 | 0.70839 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | 88 | 398.0 | 592.0 | 0.17683 | 226.6 | 337.1 | | | |
| | | | | | | | | Open | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | | | | | | | | |
| 796.0 | -0.3737 | 0.78582 | 97501 HALKIRK_W1 | 240 | 97640 CLEMENT | 4 | 240 | 59 | C: 649 HANSMAN7 | 240 | 97641 PEMUKAN | 4 | 240 | 01 | 130 | -200.6 | -498.0 | -0.28504 | -53.6 | -280.5 | |
| | | | | | | | | | Open | 649 HANSMAN7 | 240 | 97641 PEMUKAN | 4 | 240 | 01 | | | | | | |
| 911.1 | -0.2999 | - | 152 RED DEE4 | 240 | 1422 NEVIS | 4 | 240 | 12 | Base Case | | | | | | | | | | | | |
| 919.6 | -0.3224 | -0.12562 | 152 RED DEE4 | 240 | 1422 NEVIS | 4 | 240 | 12 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -252.5 | -549.0 | -0.29994 | -225.7 | -501.5 | | |
| | | | | | | | | | Open | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | | |
| 921.7 | -0.3037 | -0.59782 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -353.1 | -633.0 | -0.19009 | -221.0 | -396.2 | | | |
| | | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | | |
| 922.0 | -0.3037 | -0.59775 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -353.0 | -633.0 | -0.19003 | -220.9 | -396.1 | | | |
| | | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | | |
| 942.2 | -0.2479 | -0.23059 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 152 RED DEE4 | 240 | 1422 NEVIS | 4 | 240 | 12 | 45 | -265.4 | -499.0 | -0.17875 | -213.4 | -381.8 | | |
| | | | | | | | | | Open | 152 RED DEE4 | 240 | 1422 NEVIS | 4 | 240 | 12 | | | | | | |
| 955.9 | -0.3172 | -0.09083 | 152 RED DEE4 | 240 | 1422 NEVIS | 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -245.8 | -549.0 | -0.29994 | -225.7 | -512.4 | | |
| | | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | | |
| 955.9 | -0.3172 | -0.09081 | 152 RED DEE4 | 240 | 1422 NEVIS | 4 | 240 | 12 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -245.8 | -549.0 | -0.29994 | -225.7 | -512.4 | | |
| | | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | | |
| 956.3 | -0.2329 | -0.28475 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -276.3 | -499.0 | -0.17875 | -213.4 | -384.3 | | | |
| | | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | | |
| 956.5 | -0.2329 | -0.28471 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -276.3 | -499.0 | -0.17875 | -213.4 | -384.3 | | | |
| | | | | | | | | | Open | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | | |
| 990.4 | -0.2818 | -0.61706 | 1422 NEVIS | 4 | 240 | 1499 CORDEL | 4 | 240 | 20 | C: 1422 NEVIS | 4 | 240 | 10422 766S901T | 240 | 1 | 207 | -219.9 | -499.0 | -0.25261 | -204.4 | -454.6 |
| | | | | | | | | | Open | 1422 NEVIS | 4 | 240 | 10422 766S901T | 240 | 1 | | | | | | |

Table B-15 FCITC 2017 Winter Peak Case Alternative 3

| FCITC | TDF | LODF | Limiting Constraint | | | | Contingency | | | | Ncon | PreShift | Rating | PTDF | PreShftBase | PostShftBase | | |
|-------|---------|----------|---------------------|-----|------------------|-----|-------------|----------------------|-----|-----------------|------|----------|--------|--------|-------------|--------------|--------|--------|
| 370.2 | -0.0970 | 0.19829 | 1422 NEVIS 4 | 240 | 10422 766S901T | 240 | 1 | C: 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | 206 | -64.1 | -100.0 | -0.04981 | -25.8 | -44.3 |
| | | | | | | | | Open 1422 NEVIS 4 | 240 | 1499 CORDEL 4 | 240 | 20 | | | | | | |
| 584.1 | 0.3191 | 0.70979 | 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 31 | C: 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | 88 | 405.6 | 592.0 | 0.18148 | 230.7 | 336.7 |
| | | | | | | | | Open 225 WARE JCT | 240 | 430 W BROOK4 | 240 | 1 | | | | | | |
| 752.6 | 0.3239 | 0.59605 | 1484 ANDERSO4 | 240 | 97501 HALKIRK_W1 | 240 | 59 | C: 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | 272 | 254.3 | 498.0 | 0.24078 | 93.3 | 274.5 |
| | | | | | | | | Open 97641 PEMUKAN 4 | 240 | 97642 LANFINE 4 | 240 | 01 | | | | | | |
| 872.6 | -0.3121 | -0.59996 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -360.7 | -633.0 | -0.19508 | -225.4 | -395.7 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 872.8 | -0.3121 | -0.59990 | 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -360.6 | -633.0 | -0.19503 | -225.4 | -395.6 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 906.6 | -0.2393 | -0.28640 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | 91 | -282.0 | -499.0 | -0.18345 | -217.5 | -383.8 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 50 | | | | | | |
| 906.8 | -0.2393 | -0.28635 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | 90 | -282.0 | -499.0 | -0.18345 | -217.5 | -383.8 |
| | | | | | | | | Open 225 WARE JCT | 240 | 1484 ANDERSO4 | 240 | 34 | | | | | | |
| 934.6 | -0.2489 | -0.22723 | 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | C: 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | 45 | -266.4 | -499.0 | -0.18345 | -217.5 | -388.9 |
| | | | | | | | | Open 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | | | | | | |
| 985.3 | -0.2880 | - | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | Base Case | | | | | | -215.3 | -499.0 | | | |
| 990.6 | -0.3103 | -0.12138 | 152 RED DEE4 | 240 | 1422 NEVIS 4 | 240 | 12 | C: 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | 114 | -241.7 | -549.0 | -0.28798 | -215.3 | -500.5 |
| | | | | | | | | Open 430 W BROOK4 | 240 | 1484 ANDERSO4 | 240 | 33 | | | | | | |